AMENDMENTS TO THE CLAIMS

1. (Original) An electrochemical method for detecting a target polynucleotide, comprising:

obtaining a first electrochemical signal comprising a portion arising from a first amount of a probe molecule not intercalated with the target polynucleotide;

modifying an amount of target polynucleotide in fluid communication with the first amount of probe molecule; and

obtaining a second electrochemical signal comprising a portion arising from a second amount of probe molecule not intercalated with the target polynucleotide.

2. (Original) The electrochemical method of claim 1, wherein, upon modifying an amount of target polynucleotide, a portion Δ of the first amount of probe molecule intercalates with the target polynucleotide, the second electrochemical signal being different from the first electrochemical signal by an amount indicative of Δ.

3. (Currently amended) The electrochemical method of claim 1, wherein the first and second electrochemical signals are substantially free of an electrochemical signal from the intercalated probe molecule.

4. (Currently amended) The electrochemical method of claim 1, wherein the probe molecule is substantially free of polynucleotides having a length of at least 8 bases.

5. (Original) The electrochemical method of claim 4, wherein the first and second electrochemical signals arise from an electrochemically active moiety of the probe molecule that is free of purines.

6. (Original) The electrochemical method of claim 5, wherein the probe molecule comprises at least two cyclic groups.

7. (Original) The electrochemical method of claim 5, wherein the probe molecule comprises at least three 6 membered rings.

8. (Original) The electrochemical method of claim 6, wherein the probe molecule comprises an anthracycline, methylene blue, or derivative thereof.

9. (Original) The electrochemical method of claim 5, wherein the probe molecule is selected from the group consisting of daunomycin, doxorubicin, methylene blue, toluidine blue O, azure A, azure B, azure C, and thionin.

10. (Original) The electrochemical method of claim 5, wherein the probe molecule comprises (a) a polynucleotide having a sequence sufficiently complementary to a sequence of the target polynucleotide to form a duplex therewith and (b) an electrochemically active moiety that is free of purines, the first and second electrochemical signals arising from the electrochemically active moiety.

11. (Original) The electrochemical method of claim 10, further comprising detecting a second polynucleotide, the method comprising:

obtaining a third electrochemical signal comprising a portion arising from a first amount of a second probe molecule not intercalated with the target polynucleotide or the second target polynucleotide, the second probe molecule comprising (a) a polynucleotide having a sequence sufficiently complementary to a sequence of the second target polynucleotide to form a duplex therewith and different from the sequence of the polynucleotide of the probe molecule and (b) an electrochemically active moiety that is free of purines;

modifying an amount of the second target polynucleotide in fluid communication with the first amount of the second probe molecule; and

obtaining a second electrochemical signal comprising a portion arising from a second amount of the second probe molecule not intercalated with either the target polynucleotide or the second polynucleotide.

12. (Original) The electrochemical method of claim 1, wherein the first and second electrochemical signals are obtained using an electrode and the second electrochemical signal is obtained without contacting the electrode with fresh probe molecule intermediate obtaining the first and second electrochemical signals.

13. (Original) The electrochemical method of claim 1, wherein the second electrochemical signal is substantially free of a portion arising from an oxidation or reduction of guanine residues, if present, of the target polynucleotide.

14 – 20. (Cancelled)

21. (Original) An electrochemical method for detecting a target polynucleotide, comprising:

obtaining a first electrochemical signal from a first amount of a probe molecule immobilized with respect to an electrode;

modifying an amount of target polynucleotide in fluid communication with the first amount of probe molecule; and

obtaining a second electrochemical signal from a second amount of the probe molecule immobilized with respect to the electrode.

22. (Original) The electrochemical method of claim 21, wherein the probe molecule is substantially free of polynucleotides having a length of at least 8 bases.

23. (Original) The electrochemical method of claim 22, wherein the first and second electrochemical signals arise from an electrochemically active moiety of the probe molecule that is free of purines.

24. (Original) The electrochemical method of claim 21, wherein the second electrochemical signal is substantially free of a portion arising from an oxidation or reduction of guanine residues, if present, of the target polynucleotide.

25. (Original) The electrochemical method of claim 21, wherein the probe molecule is selected from the group consisting of daunomycin, doxorubicin, methylene blue, toluidine blue O, azure A, azure B, azure C, and thionin.

26. (Original) The electrochemical method of claim 21, wherein the first and second electrochemical signals are obtained using an electrode and the second electrochemical signal is obtained without contacting the electrode with fresh probe molecule intermediate obtaining the first and second electrochemical signals.

27 – 45. (Cancelled)

46. (Original) An electrochemical method for detecting a polynucleotide, comprising:

obtaining a first electrochemical signal from a first amount of probe molecule in the presence of a first polynucleotide and a second polynucleotide, the first and second polynucleotides being sufficiently complementary to form a duplex;

subjecting the first and second polynucleotides to at least one of an annealing step or a melting step in the presence of the first amount of probe molecule; and then, obtaining a second electrochemical signal from the probe molecule.

47. (Original) The electrochemical method of claim 46, wherein the first electrochemical signal is obtained at a temperature below the melting point of the duplex region and the second electrochemical signal is obtained at a temperature at least as great as the melting point of the duplex.

48. (Original) The electrochemical method of claim 46, wherein subjecting the first and second polynucleotides to at least one of an annealing step or a melting step further comprises subjecting the first and second polynucleotides to at least one amplification step intermediate obtaining the first and second electrochemical signals and in the presence of the probe molecule.

49. (Original) The electrochemical method of claim 46, wherein the first electrochemical signal is obtained using an electrode and the method comprises contacting the electrode with a liquid prior to obtaining the first electrochemical signal, the electrode being dry prior to being contacted with the liquid.

50. (Original) The electrochemical method of claim 46, wherein the first electrochemical signal is obtained using an electrode and the method comprises contacting the electrode with a liquid prior to obtaining the first electrochemical signal, prior to the contacting step, the electrode comprising at least a portion of the first amount of probe molecule reversibly immobilized with respect thereto.

51. (Original) The electrochemical method of claim 46, wherein the probe molecule is substantially free of polynucleotides having a length of at least 8 bases.

52. (Original) The electrochemical method of claim 51, wherein the first and second electrochemical signals arise from an electrochemically active-moiety of the probe molecule that is free of purines.

53. (Original) The electrochemical method of claim 51, wherein the first and second electrochemical signals are substantially free of a contribution arising from an oxidation or a reduction of guanine.

54 – 65. (Cancelled)